

WHAT IS CLAIMED IS:

1. An image processing apparatus comprising:
  - an information embedding unit that embeds, into an image signal, decision information that is information about a specific parameter of an image;
  - an image-signal transmission unit that sends to an external device the image signal with the decision information;
  - an image-signal reception unit that receives from the external device the image signal with the decision information;
- 10 an embedded-information extraction unit that extracts the decision information from the image signal received;
  - a parameter setting unit that determines degree of alteration of the image based on the decision information extracted and sets an image processing parameter based on the degree of alteration
- 15 determined; and
  - an image processing unit that subjects the image signal received to image processing based on the image processing parameter set.
- 20 2. The image processing apparatus according to claim 1, wherein the decision information is information about degree of alteration of a spatial frequency characteristic of the image.
3. The image processing apparatus according to claim 1, wherein  
25 the decision information is information about degree of alteration of

graininess of the image.

4. The image processing apparatus according to claim 1, wherein the decision information is information about degree of alteration of density of the image.
5. The image processing apparatus according to claim 1, wherein the decision information is information about degree of alteration of the image and pixel position information that indicates where the decision information is embedded into the image signal, and
  - the embedded-information extraction unit extracts the pixel position information, and then extracts the decision information based on the pixel position information.
- 15 6. The image processing apparatus according to claim 1, wherein the decision information is a predetermined analysis pattern.
7. The image processing apparatus according to claim 6, wherein the decision information is embedded in an image area where it is hard for a user to recognize the analysis pattern.
- 20 8. The image processing apparatus according to claim 7, wherein the decision information is embedded in a mesh image area.

9. The image processing apparatus according to claim 6, further comprising an image area separation unit that identifies areas in the image, and

the information embedding unit embeds the decision information  
5 in accordance with the areas identified.

10. The image processing apparatus according to claim 1, wherein the decision information is numerical information representing a status of the image before the decision information is embedded.

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11. The image processing apparatus according to claim 1, wherein the decision information is numerical information representing a status of the image before the decision information is embedded and information about position where the numerical information is  
15 embedded, and

the information embedding unit embeds the decision information as an electronic watermark.

12.  
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The image processing apparatus according to claim 11, wherein the information embedding unit embeds the decision information as a plurality of electronic watermarks of respectively different durability and characteristics.

13. The image processing apparatus according to claim 1, wherein  
25 the information embedding unit embeds the decision information in an

image signal that has been subjected to image processing that includes any one of a resolution conversion process and a compression process in the image processing unit, and

- the parameter setting unit sets the image processing parameter
- 5      based on both a parameter adjustment value according to contents of the image processing performed by the image processing unit and a parameter adjustment value according to the degree of alteration of the image based on the decision information extracted.
- 10     14.    The image processing apparatus according to claim 1, wherein the information embedding unit embeds the decision information in an image signal that has been subjected to image processing that includes any one of a resolution conversion process and a compression process in the image processing unit, and
- 15       the embedded-information extraction unit that extracts the decision information from the image signal subjected to a process of resolution conversion to an original resolution and an expansion process.
- 20     15.    An image processing apparatus comprising:  
                an information embedding unit that embeds, into an image signal, information about density level of a predetermined pixel of an image and information about a position where the information about density level is embedded in the image signal;
- 25       an image-signal transmission unit that sends to an external

device the image signal with the information about the density level and the information about the position;

- an image-signal reception unit that receives from the external device the image signal with the information about the density level and
- 5 the information about the position;

an embedded-information extraction unit that extracts the information about the density level and the information about the position from the image signal received;

- a density-level detection unit that detects a present density level
- 10 of the predetermined pixel at a position corresponding to the information about the position based on the information about the position extracted;

- a parameter setting unit that determines degree of alteration of an image density of the image based on the present density level
- 15 detected by the density-level detection unit and the information about the density level extracted by the embedded-information extraction unit, and sets an image processing parameter based on the degree of alteration determined; and

- an image processing unit that subjects the image signal
- 20 received to image processing based on the image processing parameter set.

16. The image processing apparatus according to claim 15, wherein the predetermined pixel is a pixel of a white background level.

17. The image processing apparatus according to claim 15, wherein the predetermined pixel is a black character pixel on a white background.

5 18. The image processing apparatus according to claim 15, wherein the predetermined pixel is a white pixel adjoining a black character on a white background.

19. An image processing apparatus comprising:

10 an information embedding unit that embeds, into an image signal a number that is a total number of pixels that have a predetermined image attribute in an image;

an image-signal transmission unit that sends to an external device the image signal with the number embedded;

15 an image-signal reception unit that receives from the external device the image signal with the number embedded;

an embedded-information extraction unit that extracts the number from the image signal received;

20 an image area separation unit that separates pixels that have the predetermined image attribute;

a pixel counting unit that calculates a total of the pixels separated by the image area separation unit as a present total;

a parameter setting unit that determines degree of alteration of the image based on the present total calculated by the pixel counting unit and the number extracted by the embedded-information extraction

unit, and sets an image processing parameter based on the degree of alteration determined; and

an image processing unit that subjects the image signal received to image processing based on the image processing

5 parameter set.

20. An image processing apparatus comprising:

an information embedding unit that embeds, into an image signal, decision information that is information about a specific

10 parameter of an image; and

an image-signal transmission unit that sends to an external device the image signal with the decision information.

21. An image processing apparatus comprising:

15 an image-signal reception unit that receives from an external device an image signal in which decision information that is information about a specific parameter of an image is embedded;

an embedded-information extraction unit that extracts the decision information from the image signal received;

20 a parameter setting unit that determines degree of alteration of the image based on the decision information extracted and sets an image processing parameter based on the degree of alteration determined; and

an image processing unit that subjects the image signal

25 received to image processing based on the image processing

parameter set.

22. A method of processing image, comprising:
  - embedding into an image signal, decision information that is
  - 5 information about a specific parameter of an image;
  - sending to an external device the image signal with the decision
  - information;
  - receiving from the external device the image signal with the
  - decision information;
- 10 extracting the decision information from the image signal
- received;
- determining degree of alteration of the image based on the
- decision information extracted and setting an image processing
- parameter based on the degree of alteration determined; and
- 15 subjecting the image signal received to image processing based
- on the image processing parameter set.